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Remarks/Arguments

Applicant has carefully considered the rejections in the previous office action and submits the following response. The drawings and amendments add no new matter, as seen from the paragraphs spanning p 3, l. 23 - p. 4, l. 22 of the specification (amended above).

Rejection of Claims 1-7, 9-17, and 18-21 over Suppes in view of Chen, Wittenbrink, Berlowitz and Tanasawa

The examiner rejects claims 1-7, 9-17, and 18-21 as obvious over Suppes in view of Chen, Wittenbrink, Berlowitz and Tanasawa.

Response

The Supreme Court recently observed that "inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. \_\_\_, 127 S.Ct. 1727, 82 U.S.P.Q.2d 1385, 1396 (U.S. 2007). For this reason, "[a] patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, *independently*, known in the prior art." *Id.* (emphasis added). In order to establish that a claim is obvious, the examiner must establish that the claims are directed merely to "the predictable use of prior art elements according to their *established functions*." *Id.* (emphasis added). Where the examiner relies on a combination of references, the examiner must establish an apparent reason to combine known elements **in the fashion claimed**. *Id.* (emphasis added).

The examiner cannot meet this burden with respect to the amended claims. The amendments to the claims find support at US 2005/021991, [00015].

-Suppes

Suppes states that "blends comprised primarily of syncrude are **potentially good CI [Compression-Ignition] fuels**," and that "fuels based on >70% Fischer-Tropsch syncrude ... would [provide] an affordable **liquid fuel that can be used in conventional diesel engines**." Suppes, column 2, second full paragraph at page 2031 (emphasis added).

A liquid fuel that can be used in conventional diesel engines would be a "diesel fuel." The phrase "diesel fuel" typically refers to a distillate fuel blended from a variety of refinery streams to meet desired specifications:

No. 1 diesel fuel (sometimes called super-diesel) is generally made from virgin or hydrocracked stocks having cetane numbers above 45. It . . . has a boiling range of from about 360 °F to 600 °F (182 to 316°C) and is used in high-speed engines in automobiles, trucks, and buses.

No. 2 diesel fuel is very similar to No. 2 fuel oil, and has a wider boiling range than No. 1. It usually contains cracked stocks and may be blended from naphtha, kerosine, and light cracked oils from the coker and the fluid catalytic cracking unit. Limiting specifications are flash point [125 °F (52°C)], sulfur content (0.05% max.), distillation range, cetane number or cetane index (40 min.), percent aromatics, and cloud point.

J. Gary, et al. *Petroleum Refining, Technology and Economics* (4<sup>th</sup> Ed. 2001) 17-18.

A diesel fuel generally is burned by a vehicle traveling from one destination to another on a road. Diesel fuel emissions generally are distributed into the atmosphere--a non-enclosed area. In contrast, air that contains emissions from the burning of home heating oil is emitted into an enclosed space over a period of time, and **must be safe for people to breathe.**

The examiner cannot demonstrate that it was an *established function* of any diesel fuel to "perform[] one or more procedure selected from the group consisting of heating water with the flue gasses by indirect heat exchange in a boiler and directly heating a space with the flue gasses." Nor can the examiner demonstrate that Suppes establishes that the claims are directed merely to "the predictable use of prior art elements **according to their established functions.**" *Id.* (emphasis added).

**-Chen**

The examiner cites Chen, Wittenbrink, and Berlowitz as teaching that Fischer Tropsch-derived fuels are "suitable fuels in many [fields] such as "home heating oil, diesel and jet fuels." Office Action, p. 3.

The only reference which the examiner has demonstrated even mentions home heating oil is Chen. However, the examiner has not established an apparent

reason to combine Suppes and Chen to use Chen's highly paraffinic second stage product as a home heating oil. Rather, it is Chen's highly aromatic "first middle distillate fraction" that is described as meeting "product specifications for use as a home heating oil." Chen, col. 10, ll. 31-32. The examiner certainly has not established that Chen describes the use of a Fischer Tropsch-derived fuel as a home heating oil.

Chen states that "the invention relates to refining of **petroleum** hydrocarbons and more particularly to a two-stage integrated hydroprocessing scheme in which high boiling **petroleum** feedstocks may be converted to relatively lower boiling products including high quality naphthas and middle distillates, including jet fuels, kerosenes, and light fuel oils." Chen, col. 1, ll. 7-15 (emphasis added). Chen explains that,

[a]s a generalization, the **aromatic content** of the feeds used in the present process **will be at least 30, usually at least 40 weight percent and in many cases at least 50 weight percent**. The balance will be divided among paraffins and naphthenes according to the origin of the feed and its previous processing. Catalytically cracked stocks will tend to have higher aromatic contents than other feeds and in some cases, the aromatic content may exceed 60 weight percent.

Chen, col. 7, ll. 12-20 (emphasis added).

Chen states that "[t]he objective of the hydrocracking which is carried out in the first stage of the operation is to provide a feed with a relatively **high concentration of paraffins for processing in the second stage** over the zeolite beta based catalyst." Chen, col. 8, ll. 47-51. Chen explains that "[t]he paraffins in the feed [to the first stage] are less subject to conversion during this part of the process and so they remain in the higher boiling (above naphtha) fractions." Chen, col. 10, ll. 10-12. Chen states that the aromatic "first middle distillate fraction" from the first stage meets "product specifications for use as a light fuel oil, e.g., **a home heating oil**." Chen, col. 10, ll. 30-32.

Chen goes on to explain that "the unconverted fraction is converted in the second stage of treatment to high quality, low pour point distillates by treatment with the zeolite beta catalyst." Chen, col. 9, ll. 43-49 (emphasis added). Chen says

that **“the desired highly iso-paraffinic product”** is formed in Chen’s second stage. Chen, col. 10, ll. 14-15 (emphasis added).

The examiner cannot establish that Chen provides an apparent reason to use even this highly iso-paraffinic product from Chen’s second stage as a home heating oil. Chen explains that “[p]rocessing of the paraffin rich bottoms fraction in the subsequent hydroisomerization step [] results in higher total yields of **iso-paraffinic liquid products such as jet fuel and low pour point distillate.**” Chen explains that such highly paraffinic products are “very suitable for sale as **jet fuel and diesel fuel.** The quality of the distillate produced is such a nature that **it may be sold as JP-4 jet fuel or even as the high energy, highest quality jet fuel, JP-7.**” Chen, col. 10, l. 68-col. 11, l. 9.

As seen from the foregoing, the examiner cannot establish an apparent reason to combine Suppes with Chen in a fashion that would even provide Chen’s **petroleum-derived “highly iso-paraffinic product”** from Chen’s second stage to “a yellow flame burner adapted for domestic heating” and to “perform[] one or more procedure selected from the group consisting of heating water with the flue gasses by indirect heat exchange in a boiler and directly heating a space with the flue gasses.” See claims 1, 11, and 21. *Id.* (emphasis added).

The examiner certainly cannot establish that the cited references provide an apparent reason to combine Suppes and Chen **in the fashion claimed** to provide a Fischer Tropsch-derived fuel “comprising about 40 wt.% or more of a Fischer Tropsch product comprising 80 wt.% or more of iso-paraffins and normal paraffins having the claimed composition” to “a yellow flame burner adapted for domestic heating” and to “perform[] one or more procedure selected from the group consisting of heating water with the flue gasses by indirect heat exchange in a boiler and directly heating a space with the flue gasses.” See claims 1, 11, and 21. *Id.* (emphasis added).

#### **-Remaining references**

The examiner also cannot demonstrate that the remaining references establish an apparent reason to combine known elements **in the fashion claimed.**

The examiner cannot establish that Wittenbrink's description related to "a **transportation fuel**" provides an apparent reason to combine known elements in the fashion claimed. See Wittenbrink, col. 1, ll. 5-6. The examiner cannot establish that Berlowitz' description related to "**diesel engine fuel**" for "combustion in a **vehicular diesel engine**" provides an apparent reason to combine known elements in the fashion claimed. See Chen, col. 1, ll. 7-8. Nor can the examiner establish that Tanasawa's description related to a **vortex combuster** which may be used for "yellow flame combustion or . . . blue flame combustion" provides an apparent reason to combine known elements in the fashion claimed.

The examiner also cannot establish that U.S. Patent No. 6,392,108 (O'Rear) and/or U.S. Patent No. 6800101 (O'Reilly et al) establish an apparent reason to combine the known elements **in the fashion claimed**. O'Rear describes "methods of inhibiting oxidation in Fischer Tropsch products, and antioxidants for use with Fischer Tropsch products." O'Rear, Abstract. O'Reilly et al describes "the use of deactivatable biocides for hydrocarbonaceous products" where the "deactivatable biocides . . . may be derived from a Fischer-Tropsch process." O'Rear and O'Reilly do not change the foregoing analysis.

The examiner simply cannot establish an apparent reason to combine known elements **in the fashion claimed**, and cannot establish a case of *prima facie* obviousness of the pending claims over the cited references. Applicant respectfully requests that the rejection be withdrawn.

**The claimed method achieves superior results**

Applicant is not required to provide objective evidence of non-obviousness because the examiner cannot establish a case of *prima facie* obviousness. However, Applicant would direct the examiner's attention to the superior results described in the specification.

The specification explains that "low hydrocarbon and carbon monoxide emissions have been found **at the start of the burner running on the Fischer-Tropsch derived fuel**." Publication US 2005/0271191, ¶ [0011]. This is said to be "very advantageous, especially when such a burner is used in a domestic environment, wherein frequent start and stops of the burner are common." US

2005/0271991, paragraph [0007]. The application also explains that "using a Fischer-Tropsch derived fuel a very low lambda of between 1.05 and 1.2 [can] be applied without large emissions of carbon monoxide as would be the case when Industrial Gas Oil would be used." Publication US 2005/0271191, ¶ [0010].

The inability to establish an apparent reason to combine the references in the fashion claimed is particularly telling in light of the superior results achieved by making the combination.

For all of the foregoing reasons, the examiner cannot establish a case of *prima facie* obviousness over the cited references. Applicant respectfully requests that the rejection be withdrawn. The remaining claims depend from claims 1, 11, and 21 and are allowable for the same reasons.

#### **Drawings**

The examiner objects to the drawings under 37 CFR 1.83(a) as not showing every feature of the claims. Specifically, the examiner contends that that the "means for" performing the recited procedures must be described.

Applicant first notes that the claims do not include the phrase "means for," and the claims are not intended to be construed as means-plus-function claims.

Rule 37 CFR 1.83(a) states that "conventional features disclosed in the description and claims, where their detailed illustration is not essential for a proper understanding of the invention, should be illustrated in the drawing in the form of a graphical drawing symbol or a labeled representation." New Sheets of drawings, including new Fig. 1A and new Fig. 1B, and the amendments to paragraphs [0011] and [0012] are believed to overcome the objection.

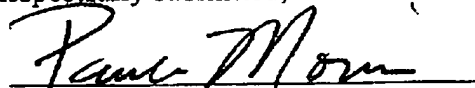
Applicant respectfully requests that the objection be withdrawn.

#### **CONCLUSION**

For all of the foregoing reasons, Applicant submits that the application is in a condition for allowance. If the examiner finds the application other than in condition for allowance, the examiner is requested to call the undersigned attorney at the Houston, Texas telephone number (713) 334-5151 x 200 to discuss the steps necessary for placing the application in condition for allowance. The Commissioner is hereby authorized to charge any fees in connection with this paper, or to credit

any overpayment, to Deposit Account No. 19-1800 (File No. TS8577), maintained by Shell Oil Company.

Respectfully submitted,



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